List of Figures

Fig.1.1. Structure of Troponin Complex

Fig.1.2. Flow Chart Presenting the Events in Muscle Contraction

Fig.1.3. Schematic Presentation of Cardiac Troponin Release after Myocardial Infarction

Fig.1.4. Chart Presenting Characteristics of cTnI as the Biomarker

Fig.2.1. Schematic Representation showing the attachment of Cardiac Troponin I on Gold nanoparticles resulting in changes in the UV-Vis spectra

Fig.2.2. Image of Gold Nanoparticles

Fig.2.3. Average Size of AuNPs recorded using Malvern Zeta Sizer Analyzer

Fig.2.4. SEM Image of Gold Nanoparticles

Fig.2.5. UV-Visible Spectra of Gold Nanoparticles

Fig.2.6. UV-Visible Spectra of AuNPs and Cardiac Troponin I Samples

Fig.2.7. Change in Absorbance vs. different mole fraction of Pure and Degraded cTnI

Fig.2.8. Fluorescence Spectra of cTnI with Different Concentrations of AuNPs showing the Quenching Effect of AuNPs

Fig.2.9. UV-Visible Spectra of AuNPs and cTnI Samples in a Time Dependent Study

Fig.2.10. Change in Absorbance with Time dependent study of cTnI
LIST OF FIGURES

Fig. 2.11. Change in Absorbance with Incubation Time

Fig. 2.12. UV-Visible Spectra of Different Incubation Time of AuNPs with cTnI

Fig. 2.13. UV-Visible Spectra of AuNPs of Size 15 nm and 20 nm and their incubation with cTnI

Fig. 2.14. Size Dependent Changes in Absorbance of Pure AuNPs and AuNP with cTnI

Fig. 2.15. UV-Visible Spectra at Different Concentrations of AuNPs with cTnI

Fig. 2.16. Concentration dependent Changes in Absorbance of cTnI with AuNPs.

Fig. 3.1. Classification of Asphyxia

Fig. 3.2. Chemical Structure of Acebutolol Hydrochloride

Fig. 3.3. Schematic Illustration of Protein Fractionation by SDS-PAGE

Fig. 3.4. Schematic Illustration of Western Blot Setup

Fig. 3.5. Western blot analysis of cTnI degradation in myocardium in Control subject. (Lane 1: Standard, Lane 2: 0 hrs, Lane 3: 6 hrs, Lane 4: 12 hrs, Lane 5: 24 hrs, Lane 6: 48 hrs, Lane 7: 72 hrs, Lane 8: 96 hrs)

Fig. 3.6. Western blot analysis of cTnI degradation in myocardium after death due to Acebutolol poisoning. (Lane 1: Standard, Lane 2: 0 hrs, Lane 3: 6 hrs, Lane 4: 12 hrs, Lane 5: 24 hrs, Lane 6: 48 hrs, Lane 7: 72 hrs, Lane 8: 96 hrs)

Fig. 3.7. Western blot analysis of cTnI degradation in myocardium after death due to Asphyxia. (Lane 1: Standard, Lane 2: 0 hrs, Lane 3: 6 hrs, Lane 4: 12 hrs, Lane 5: 24 hrs, Lane 6: 48 hrs, Lane 7: 72 hrs, Lane 8: 96 hrs)

X
LIST OF FIGURES

Fig.3.8. Plot of cTnI degradation into its lower molecular weight fragments with Time in Control, Cardiotoxicity (Acebutolol) and Asphyxia

Fig.4.1. Structure of Antibody

Fig.4.2. Advantages in the conjugation of nanoparticles with antibodies

Fig.4.3. Schematic Illustration of Synthesis of AuNP – Antibody (anti- cTnI) Conjugate

Fig.4.4. Schematic Illustration of Gold Nanoparticle conjugate based assay

Fig.4.5. UV Spectrum of 15 nm gold nanoparticles

Fig.4.6. Average Size of AuNPs recorded using Malvern zeta- sizer analyser

Fig.4.7. SEM Image of 15 nm Gold Nanoparticles

Fig.4.8. UV spectra AuNP conjugates with incubation of cTnI extracted from sacrificed rats at different postmortem interval

Fig.4.9. Change in Absorbance vs. Postmortem Interval

Fig.4.10. UV spectra of AuNP conjugate after incubation with a non specific antigen

Fig.4.11. Effect of Incubation Time of AuNP conjugates with cTnI

Fig.4.12. UV spectra of AuNP conjugates incubated at different intervals of time with cTnI
List of Tables

Table 2.1. Sample Preparation of Different Mole Fractions of cTnI

Table 2.2. Change in Absorbance in a Time Dependent Degradation of cTnI when incubated with AuNPs

Table 3.1. Reagents Required for Preparing Various Buffers Required in SDS-PAGE

Table 3.2. Comparison of Decrease in Molecular Weights of cTnI with Time in Various Groups of Study

Table 3.3. Statistical Analysis of Change in Molecular Weights with Respect to Post mortem Interval in the three groups of study

Table 4.1. Change in absorbance with postmortem interval and standard deviation
**List of Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AuNPs</td>
<td>Gold Nanoparticles</td>
</tr>
<tr>
<td>cTnI</td>
<td>Cardiac Troponin I</td>
</tr>
<tr>
<td>SEM</td>
<td>Scanning Electron Microscope</td>
</tr>
<tr>
<td>CKMB</td>
<td>Creatine Kinase Myoglobin</td>
</tr>
<tr>
<td>LDH</td>
<td>Lactase Dehydrogenase</td>
</tr>
<tr>
<td>PBS</td>
<td>Phosphate Buffer Saline</td>
</tr>
<tr>
<td>BSA</td>
<td>Bovine Serum Albumin</td>
</tr>
<tr>
<td>HCG</td>
<td>Human chorionic gonadotropin</td>
</tr>
<tr>
<td>SDS</td>
<td>Sodium Dodecyl Sulphate</td>
</tr>
<tr>
<td>HCL</td>
<td>Hydrochloric Acid</td>
</tr>
<tr>
<td>HAuCl₄</td>
<td>Chloroauric Acid</td>
</tr>
<tr>
<td>UV-Vis</td>
<td>Ultraviolet and Visible</td>
</tr>
<tr>
<td>ECG</td>
<td>Electrocardiogram</td>
</tr>
<tr>
<td>AMI</td>
<td>Acute myocardial infarction</td>
</tr>
<tr>
<td>Trp</td>
<td>Tryptophan</td>
</tr>
<tr>
<td>Abs</td>
<td>Absorbance</td>
</tr>
<tr>
<td>SPR</td>
<td>Surface Plasmon Resonance</td>
</tr>
</tbody>
</table>